REMARKS

Claims 29-32, 34-39, 41, 44-47, 49 and 51-64 are pending in this application. Claims 29, 36, 55, 59 and 60 have been amended. No new matter has been introduced.

Claims 29-32, 34-39, 41, 44-47, 49 and 51-64 stand rejected under 35 U.S.C. § 102 as being anticipated by Xing et al. (U.S. Patent No. 6,090,697) ("Xing"). This rejection is respectfully traversed.

The claimed invention relates to an electropolished patterned metal layer formed as part of a semiconductor device. As such, amended independent claim 29 recites a semiconductor device comprising *inter alia* "an insulating layer provided over said substrate" and "an electropolished patterned metal layer provided within an opening of said insulating layer." Amended independent claim 29 also recites that "a top surface of said electropolished metal layer is . . . at the same level with a top surface of said insulating layer." Amended independent claim 29 further recites "a photoresist plug provided within said opening and over and in contact with said electropolished patterned metal layer."

Amended independent claim 36 recites a "memory cell" comprising *inter alia* "a transistor including a gate fabricated on a semiconductor substrate" and "an electropolished patterned metal layer within an insulating layer provided over said substrate, said electropolished patterned metal layer having a thickness of about 50 to about 300 Angstroms." Amended independent claim 36 also recites "a container capacitor including a lower electrode, a dielectric layer over said lower electrode, and an upper electrode over said dielectric layer, said upper electrode comprising doped polysilicon." Amended independent claim 36 further recites that the electropolished patterned metal layer forms the lower electrode.

Independent claim 44 recites a "processor-based system" comprising *inter alia* "a container capacitor . . . comprising an electropolished patterned metal layer having a thickness of approximately 50 to 300 Angstroms." Independent claim 44 also recites that "a top surface of said electropolished patterned metal layer is at the same level with a top surface of said insulating layer."

Amended independent claim 55 recites a "container capacitor" comprising *inter alia* "a lower electrode provided within a first insulating layer, said lower electrode comprising an electropolished patterned metal layer having a bottom wall and vertical sidewalls extending rectangularly upwardly therefrom." Amended independent claim 55 further recites "a second insulating layer provided over said electropolished patterned metal layer and in contact with said first insulating layer" and "an upper electrode provided over said second insulating layer."

Amended independent claim 59 recites a "container capacitor" comprising *inter alia* "a tantalum nitride barrier conductive layer" and "a lower electrode . . . comprising an electropolished patterned metal layer." Amended independent claim 59 also recites that the electropolished patterned metal layer has "a bottom and vertical sidewalls extending upwardly from said bottom, said lower electrode having a thickness of approximately 100 Angstroms." Amended independent claim 59 further recites "a dielectric material provided over said electropolished patterned metal layer and in contact with said insulating layer" and "an upper electrode provided over said dielectric material."

Amended independent claim 60 recites a "container capacitor" comprising *inter alia* "a plurality of rectangular openings provided in said insulating layer" and "a plurality of lower capacitor electrodes provided along the bottom and sidewalls of respective ones of said rectangular openings, said lower electrodes being formed as

discrete electropolished metal layers." Amended independent claim 60 also recites "a dielectric layer associated with each of said discrete lower electrodes, said dielectric layer being in contact with said insulating layer."

Xing relates to a "high-selectivity via etching process" that "includes the steps of: forming an etchstop layer 840 of a material selected from the group consisting of Ti--Al, Ti--Al--N, Ta--Al, Al--N, Ti--Al/Ti--N, Ti--Al--N/Ti--N, Ta--Al/Ti--N, and Ti--Al/Ti--Al--N; forming a dielectric layer over the etchstop layer; and etching the dielectric layer with a fluorine-bearing etchant." (Abstract).

First, Applicant reaffirms that the limitation "electropolished patterned metal layer" is simply not a product-by-process limitation, but rather a *resulting structure* having distinct and defined characteristics. The term "electropolished patterned" describes the physical characteristics of the metal layer in independent claims 29, 36, 44, 55, 59 and 60. Specifically, the term "electropolished patterned" is a limitation of the metal layer. Claim limitations which confer distinct and defined characteristics of a structure have been analyzed by the Federal Circuit in Hazani v. U.S. Int'l Trade Comm'n, for example. Hazani v. U.S. Int'l Trade Comm'n, 126 F.3d 1473, 44 USPQ2d 1358 (Fed. Cir. 1997). An "electropolished patterned metal layer," like the "chemically engraved" plate of Hazani, is a *resulting structure* having distinct and defined characteristics and not a product formed by a particular process. Thus, this is a first reason why Xing fails to anticipate the subject matter of claims 29-32, 34-39, 41, 44-47, 49 and 51-64.

Second, Xing fails to disclose "an electropolished patterned metal layer provided within an opening of said insulating layer" and "a photoresist plug provided within said opening and over and in contact with said electropolished patterned metal layer," as amended independent claim 29 recites. Xing teaches the formation of bottom

capacitor electrode 304, which would arguably correspond to the "electropolished patterned metal layer" of the claimed invention, by conventional methods and not by electropolishing with "a photoresist plug provided within said opening and over and in contact with said electropolished patterned metal layer," as in the claimed invention.

Xing is also silent about "a container capacitor including a lower electrode, a dielectric layer . . . and an upper electrode . . . comprising doped polysilicon," as amended independent claim 36 recites. Xing teaches that the top electrode "is preferably platinum" and not "comprising doped polysilicon," as in the claimed invention. Xing also fails to disclose a "processor-based system," much less a "processor-based system" comprising *inter alia* "a container capacitor. . . comprising an electropolished patterned metal layer having a thickness of approximately 50 to 300 Angstroms," as independent claim 44 recites. Xing is further silent about "a lower electrode . . . comprising an electropolished patterned metal layer having a bottom wall and vertical sidewalls extending rectangularly upwardly therefrom," as amended independent claim 55 recites. As described and illustrated in Figure 3 of Xing, capacitor electrode 304 of Xing, which would arguably correspond to the "electropolished patterned metal layer" of the claimed invention, has vertical sidewalls that form an obtuse angle with the bottom of the capacitor and do not extend "rectangularly upwardly therefrom," as in the claimed invention.

Xing is also silent about a "container capacitor" comprising "a tantalum nitride barrier conductive layer" (claim 59), or about "a plurality of rectangular openings provided in [an] insulating layer," much less about "a plurality of lower capacitor electrodes provided along the bottom and sidewalls of respective ones of said rectangular openings" (claim 60). Xing also fails to disclose "an electropolished patterned metal layer" or "electropolished patterned metal layers," much less "an

electropolished patterned metal layer" or "electropolished patterned metal layers" as part of capacitor structures, as in the claimed invention. As noted above, the limitation "electropolished patterned metal layer" of independent claims 29, 36, 44, 55, 59 and 60 is not a product-by-process limitation, but rather a *resulting structure* having distinct and defined characteristics. For at least these reasons, Xing fails to anticipate the claimed invention, and withdrawal of the rejection of claims 29-32, 34-39, 41, 44-47, 49 and 51-64 is respectfully requested.

Allowance of the application is solicited.

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Respectfully submitted,

By _____

Thomas J. D'Amico
Registration No.: 28,371
Gabriela I. Coman
Registration No.: 50,515
DICKSTEIN SHAPIRO MORIN &
OSHINSKY LLP
2101 L Street NW
Washington, DC 20037-1526
(202) 785-9700
Attorneys for Applicant